[0077] From the stationary state **804**, if the calculated touch area is determined to be greater than the threshold touch area, the selection state **806** indicated. If the finger or stylus starts to move when the selection state **806** is indicated, the dragging state **808** is indicated. If the calculated touch area is determined to be less than or equal to the threshold touch area (i.e., the finger or stylus is lifted at least partially away from the touch screen **110**) when either the selection state **806** or the dragging state **808** has been indicated, a stop selection state **810** is indicated. From the stop selection state **810**, if the finger or stylus remains within the energized plane, the stationary state **804** is again indicated. From either the tracking state **802**, the stationary state **804** or the stop selection state **810**, if the finger or stylus has been lifted completely away from the touch screen **110**, the out-of-range state **112** is indicated.

[0078] Those skilled in the art will appreciate that the state machine diagram of FIG. **8** is provided by way of example only and that additional and/or alternative states and state transitions are possible. For instance, other embodiments of the invention can be configured to transition directly from a tracking state **802** to a selection state **806** or a dragging state **808**. Similarly, the invention can be configured in certain embodiments to transition directly from a selection state **806** or a dragging state **808** to a tracking state **802** or an out-of-range state **812**. Accordingly, the scope of the present invention is not intended to be limited by the exemplary state machine diagram of FIG. **8**, nor the exemplary flow diagram of FIG. **6**.

[0079] It should further be appreciated by those skilled in the art that certain functionality of the exemplary embodiments of the invention may be provided by way of any type and number of program modules, created in any programming language, which may or may not be stored locally at the computing device **201**. For example, the computing device **201** may comprise a network server, client, or appliance that may be configured to execute program modules that are stored on another network device and/or for controlling a remotely located touch screen system.

[0080] Based on the foregoing, it can be seen that the present invention provides an improved touch screen system that can approximate tracking and dragging states, regardless of the touch orientation and without reliance on direct sensing of touch pressure or area. Many other modifications, features and embodiments of the present invention will become evident to those of skill in the art. For example, those skilled in the art will recognize that embodiments of the present invention are useful and applicable to a variety of touch screens, including, but not limited to, optical touch screens, IR touch screens, and capacitive touch screens. It should be appreciated, therefore, that many aspects of the present invention were described above by way of example only and are not intended as required or essential elements of the invention unless explicitly stated otherwise.

[0081] Accordingly, it should be understood that the foregoing relates only to certain embodiments of the invention and that numerous changes may be made therein without departing from the spirit and scope of the invention as defined by the following claims. It should also be understood that the invention is not restricted to the illustrated embodiments and that various modifications can be made within the scope of the following claims.

What is claimed is:

1. A method of discerning between user interaction states in a touch screen system, comprising:

receiving a first signal from a first detector of said touch screen system, said first signal representing a first image of an object interacting with a touch screen;

receiving a second signal from a second detector of said touch screen system, said second signal representing a second image of the object interacting with the touch screen;

processing the first signal to determine approximated coordinates of a first pair of outer edges of the object;

processing the second signal to determine approximated coordinates of a second pair of outer edges of the object;

calculating an approximated touch area based on the approximated coordinates of the first pair of outer edges and the approximated coordinates of the second pair of outer edges of the object;

if the approximated touch area is less than or equal to a threshold touch area, determining that the object interacting with the touch screen indicates a tracking state; and

if the approximated touch area is greater than the threshold touch area, determining that the object interacting with the touch screen indicates a selection state.

2. The method of claim **1**, wherein the approximated coordinates of the first pair of outer edges and the approximated coordinates of the second pair of outer edges of the object are determined using slope line calculations.

3. The method of claim **1**, wherein the threshold touch area is established by calibrating the touch screen system when the object interacting with the touch screen is known to indicate the tracking state.

4. The method of claim **1**, wherein the threshold touch area is established by an operator of the touch screen system.

5. The method of claim **1**, further comprising:

if the object interacting with the touch screen indicates either the selection state or the tracking state, determining whether the object becomes undetected by the first detector and the second detector; and

if the object becomes undetected by the first detector and the second detector, determining that the object interacting with the touch screen indicates an out-of-range state.

6. The method of claim **1**, further comprising:

if the object interacting with the touch screen indicates the selection state, determining whether the object moves relative to the touch screen;

if the object moves relative to the touch screen, re-calculating the approximated touch area and determining whether the re-calculated touch area remains greater than or equal to the threshold touch area; and

if the re-calculated touch area remains greater than the threshold touch area, determining that the object interacting with the touch screen indicates a dragging state.

7. The method of claim **6**, further comprising if the re-calculated touch area does not remain greater than the threshold touch area, determining that the object interacting with the touch screen indicates the tracking state.

8. The method of claim **6**, further comprising:

if the object interacting with the touch screen indicates either the selection state, the dragging state or the tracking state, determining whether the object becomes undetected by the first detector and the second detector; and